

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A particle beam accelerator comprising:
 - a vacuum chamber;
 - a magnet which generates a constant magnetic field in the vacuum chamber;
 - acceleration electrodes which generates an electric magnetic field in a direction perpendicular to the direction of the magnetic field generated by the magnet in the vacuum chamber; and
 - an extraction electrode which extracts charged particles accelerated in the vacuum chamber;

wherein a deuteron beam having an energy equal to or smaller than 3.5 MeV is generated;

wherein at least a part of surfaces exposed to the charged particles of the vacuum chamber, the acceleration electrodes, and/or the extraction electrode is made of a material including an element having atomic number larger than copper.
2. (Previously Presented) The particle beam accelerator according to claim 1, wherein the particle beam accelerator is a cyclotron, and the at least a part of the surfaces exposed to the charged particles comprises surfaces, arranged along the circular orbit, of the charged particles of structural components including said vacuum chamber, said acceleration electrodes, and said extraction electrode.
3. (Previously Presented) The particle beam accelerator according to claim 1, wherein the at least a part of the surfaces exposed to the charged particles of the vacuum chamber, the acceleration electrodes, and/or the extraction electrode is covered by a sheet of the material.

4. (Previously Presented) The particle beam accelerator according to claim 3, wherein the sheet of the material is thick enough to stop the accelerated deuteron therein.
5. (Previously Presented) The particle beam accelerator according to claim 1, wherein the at least a part of the surfaces exposed to the charged particles comprises a plating layer including the material.
6. (Previously Presented) The particle beam accelerator according to claim 1, wherein the at least a part of the surfaces exposed to the charged particles comprises a coating film including the material.
7. (Previously Presented) The particle beam accelerator according to claim 1, wherein the at least a part of the surfaces exposed to the charged particles is the acceleration electrodes and the element is gold.

8-10. (Canceled)

11. (Previously Presented) The particle beam accelerator according to claim 1, further comprising a structural element made of the material arranged at a position in an area not including the electrodes for the resonator or in the valley of the poles of the electromagnet to block a part of the beam.
12. (Previously Presented) The particle beam accelerator according to claim 1, further comprising a heater provided at one of the components arranged in said vacuum chamber for heating the one of the components.
13. (Previously Presented) The particle beam accelerator according to claim 1, further comprising an instrument, provided in said vacuum chamber, for measuring a current of the

accelerated beam, wherein the at least a part of the surfaces exposed to the charged particles comprises a surface of the instrument facing the beam.

14. (Currently amended) The particle beam accelerator according to claim 1, wherein said material has a dose equivalent of neutrons for a deuteron beam of energy of 3.5 MeV of the material is equal to or smaller than $2.5 * 10^{-1}$ Sv/h/ μ A/sr Sv/h/ μ A/sr.

15. (Currently Amended) The particle beam accelerator according to claim 14, wherein the dose equivalent of neutrons for said material, when for a deuteron beam of energy of 3.5 MeV strikes of the material, is equal to or smaller than $2.5 * 10^{-2}$ Sv/h/ μ A/sr Sv/h/ μ A/sr.

16. (Previously Presented) The particle beam accelerator according to claim 18, wherein the target cell is separated from the other components in the particle beam accelerator, and a shielding wall for shielding radioactive rays generated in the target cell is provided around the target cell.

17. (Previously Presented) The particle beam accelerator according to claim 18, further comprising a synthesis apparatus which receives a substance generated in the target cell as a starting material, the synthesis apparatus being integrated as a unit with the target cell.

18. (Previously Presented) The particle beam accelerator according to claim 1, further comprising a target cell provided at a position at which the charged particles extracted by the extraction electrode strike.